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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/828,861	04/10/2001	Mariko Matsumoto	Q64013	6954

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SUGHRUE, MION, ZINN, MACPEAK & SEAS
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037

EXAMINER

WARE, CICELY Q

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 06/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/828,861

Applicant(s)

MATSUMOTO ET AL.

Examiner

Cicely Ware

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-7,11-13,17,18,21-23,27,28,29,33,34,37-39 and 43-45 is/are rejected.
- 7) ☒ Claim(s) 3,4,8-10,14-16,19,20,24-26,30-32,35,36,40-42 and 46-48 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3 and 7
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
 - a. Pg. 2, line 12, applicant uses the phrase "frequently used as internal oscillator". Examiner suggests applicant use "frequently used as an internal oscillator" for clarification purposes.
 - b. Pg. 2, lines 16-20, examiner suggests applicant re-write these lines for clarification purposes.
 - c. Pg. 19, line 5, examiner suggests applicant delete "is" for clarification purposes.
 - d. Pg. 19, lines 9 and 11, applicant uses the phrase "a control one embodiment". Examiner suggests applicant use "a control of one embodiment". Appropriate correction is required.
2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

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Claim Objections

3. Claims 3-5, 8-11, 14-16, 19-21, 24-27, 30-32, 35-36, 40-42, 46-48 are objected to because of the following informalities:

a. Claims 3, 4, 8, 9, 14, 15, 19, 20, 24, 25, 30, 31, 35, 36, 40, 41, 46, 47 line 5, examiner suggests applicant re-write this line for clarification purposes.

b. Claim 4, line 5, examiner suggests applicant re-write this line for clarification purposes.

c. Claim 5, line 7, applicant uses "comprises". Examiner suggests applicant use "comprises" for clarification purposes.

c. Claims 5, 11, 21, 27 lines 15-16, examiner suggests applicant re-write this line for clarification purposes.

d. Claims 10, 16, 26, 32, 42, 48 lines 4-5, examiner suggests applicant re-write these lines for clarification purposes.

Appropriate correction is required.

4. The claims have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the claims.

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Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 5, 11, 21, 27, 37 and 43 are rejected under 35 U.S.C. 102(e) as being anticipated by Asahara et al. (US Patent 6,353,642).

(1) With regard to claim 5, Asahara et al. discloses a portable radio system employing an automatic frequency control for detecting a frequency shift of an internal oscillator of a portable radio equipment with reference to a received wave transmitted from a base station having higher precision of frequency and adjusting the frequency of said internal oscillator by feeding back said frequency shift to said internal oscillator, wherein said portable radio equipment comprises (Fig. 13 (61, 67), Fig. 14, col. 1, lines 27-32, col. 4, lines 44-67, col. 5, lines 1-30); calculating means for calculating a phase difference of two symbols taken from a known data modulated by said base station on the basis of a timing generated by said internal oscillator; frequency shift calculating means for calculating a frequency shift of said internal oscillator by dividing said phase difference derived by said calculating means by an interval of said two symbols (col. 1, lines 61-67, col. 2, lines 1-10, col. 5, lines 1-30, 46-56); and control means for

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controlling for widening said interval when said phase difference derived by said calculating means is smaller than a predetermined set value and for narrowing said interval when said phase difference is greater than said set value (col. 16, lines 45-67, col. 17, lines 1-54).

(2) With regard to claim 11, claim 11 inherits all the limitations of claim 5.

Asahara et al. further discloses control means for controlling for widening said interval when a value of said frequency shift derived by said frequency shift calculating means is smaller than a predetermined value and for narrowing said interval when said value of said frequency shift is greater than said predetermined value (col. 2, lines 14-18).

(3) With regard to claim 21, claim 21 inherits all the limitations of claim 5.

Asahara et al. further discloses a portable radio equipment (col. 4, lines 56-60).

(4) With regard to claim 27, claim 27 inherits all the limitations of claim 11.

Asahara et al. further discloses a portable radio equipment (col. 4, lines 56-60).

(5) With regard to claim 37, claim 37 inherits all the limitations of claim 5.

Asahara et al. further discloses a frequency error predicting method (abstract).

(6) With regard to claim 43, claim 43 inherits all the limitations of claim 11.

Asahara et al. further discloses a frequency error predicting method (abstract).

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Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 1, 17 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asahara et al. (US Patent 6,353,642) in view of Corleto et al. (US Patent 6,192,089).

With regard to claim 1, Asahara discloses a portable radio system employing an automatic frequency control for detecting a frequency shift of an internal oscillator of a portable radio equipment with reference to a received wave transmitted from a base station having higher precision of frequency and adjusting the frequency of said internal oscillator by feeding back said frequency shift to said internal oscillator (Fig. 13 (61, 67), Fig. 14, col. 1, lines 27-32, col. 4, lines 44-67, col. 5, lines 1-30).

However Asahara does not disclose wherein coordinate rotation digital computation (CORDIC) is employed for calculation of arctangent in said automatic frequency control.

However Corleto et al. discloses wherein coordinate rotation digital computation (CORDIC) is employed for calculation of arctangent in said automatic frequency control (col. 3, lines 31-34, 39-45, 62-64, col. 4, lines 2-4, col. 8, lines 1-3, 43-54, 64-67).

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Therefore it would have been obvious to one of ordinary skill in the art to modify Asahara et al. to incorporate wherein coordinate rotation digital computation (CORDIC) is employed for calculation of arctangent in said automatic frequency control in order to represent the rotation through an angle as a summation of multiple rotations (Corleto et al., col. 4, lines 2-4).

(2) With regard to claim 17, claim 17 inherits all the limitations of claim 1. Asahara et al. further discloses a portable radio equipment (col. 4, lines 56-60).

(3) With regard to claim 33, claim 33 inherits all the limitations of claim 1. Asahara et al. further discloses a frequency error prediction method (abstract).

9. Claim 2, 7, 18, 29 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asahara et al. (US Patent 6,353,642) in combination with Corleto et al. (US Patent 6,192,089) as applied to claims 1, 5, 17, 27, 33 above, and further in view of Hwang et al. (US Patent 6,532,271).

(1) With regard to claim 2, claim 2 inherits all the limitations of claim 1. Asahara et al. in combination with Corleto et al. disclose all the limitations of claim 1 above. However Asahara et al. in combination with Corleto et al. do not disclose wherein, upon calculation of arc tangent, calculation is performed within a range of $\pm \pi$.

However Hwang et al. discloses wherein, upon calculation of arc tangent, calculation is performed within a range of $\pm \pi$ (col. 8, lines 52-62).

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Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Asahara et al. in combination with Corleto et al. in order to normalize the phase angles after modulation (Hwang et al., col. 8, lines 58-62).

(2) With regard to claim 7, claim 7 inherits all the limitation of claims 5 and 2.

(3) With regard to claim 18, claim 18 inherits all the limitations of claims 17 and 2.

(4) With regard to claim 29, claim 29 inherits all the limitations of claims 27 and 7.

Asahara et al. further discloses a portable radio equipment (col. 4, lines 56-60).

(5) With regard to claim 34, claim 34 inherits all the limitations of claim 33 and 2.

Asahara et al. further discloses a frequency error prediction method (abstract).

10. Claim 6, 12, 22, 28, 38 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asahara et al. (US Patent 6,353,642) as applied to claims 5, 11, 21, 37 and 43 above, in view of Brardjanian et al. (US Patent 6,590,945).

(1) With regard to claim 6, claim 6 inherits all the limitations of claim 5 above.

However Asahara et al. does not disclose wherein said two symbols are the same phase when a frequency of said internal oscillator is correct, and said calculating means derives a phase difference of said two symbols by multiplying one of said two symbols by a complex conjugate of another symbol.

However Brardjanian et al. discloses wherein said two symbols are the same phase when a frequency of said internal oscillator is correct, and said calculating means

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derives a phase difference of said two symbols by multiplying one of said two symbols by a complex conjugate of another symbol (abstract, col. 11, lines 32-55).

Therefore it would have been obvious to one of ordinary skill in the art to modify Asahara et al. to incorporate wherein said two symbols are the same phase when a frequency of said internal oscillator is correct, and said calculating means derives a phase difference of said two symbols by multiplying one of said two symbols by a complex conjugate of another symbol in order to produce a vector having an angle representing the phase angle between the successive symbol samples (Brardjanian et al., col. 11, lines 39-42).

(2) With regard to claim 12, claim 12 inherits all the limitations of claims 11 and 6.

(3) With regard to claim 22, claim 22 inherits all the limitations of claims 21 and 6. Asahara et al. further discloses a portable radio equipment (col. 4, lines 56-60).

(4) With regard to claim 28, claim 28 inherits all the limitations of claims 27 and 6 above. Asahara et al. further discloses a portable radio equipment (col. 4, lines 56-60).

(5) With regard to claim 38, claim 38 inherits all the limitations of claims 37 and 6. Asahara et al. further discloses a frequency error prediction method (abstract).

(6) with regard to claim 44, claim 44 inherits all the limitations of claim 43 and 6. Asahara et al. further discloses a frequency error prediction method (abstract).

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11. Claim 13, 23, 39 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asahara et al. (US Patent 6,353,642) in combination with Brardjanian et al. (US Patent 6,590,945), as applied to claims 12, 22, 37 and 43 above, and further in view of Mobin (US Patent 5,748,682).

(1) With regard to claim 13, claim 13 inherits all the limitations of claim 12.

Asahara et al. in combination with Brardjanian et al. disclose all the limitations of claim 12 above. However Asahara et al. in combination with Brardjanian et al. do not disclose wherein, upon calculation of arc tangent, of coordinate rotation digital computation (CORDIC), frequency shift calculating means performs calculation within a range of $\pm \pi$.

However Mobin discloses wherein, upon calculation of arc tangent, of coordinate rotation digital computation (CORDIC), frequency shift calculating means performs calculation within a range of $\pm \pi$ (col. 10, lines 15-11, 16-19, 23-24, 39-42).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Asahara et al. in combination with Corleto et al. to incorporate wherein, upon calculation of arc tangent, of coordinate rotation digital computation (CORDIC), frequency shift calculating means performs calculation within a range of $\pm \pi$ in order to provide for a continual feed forward correction of successive signal samples, which limits the differential phase comparison to a relatively small range (Mobin, col. 10, lines 5-7).

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(2) With regard to claim 23, claim 23 inherits all the limitations of claims 22 and 13. Asahara et al. further discloses a portable radio equipment (col. 4, lines 56-60).

(3) With regard to claim 39, claim 39 inherits all the limitations of claims 37 and 13. Asahara et al. further discloses a frequency error prediction method (abstract).

(4) With regard to claim 45, claim 45 inherits all the limitations of claims 43 and 13. Asahara et al. further discloses a frequency error prediction method (abstract).

Allowable Subject Matter

12. Claims 3, 4, 8, 9, 10, 14, 15, 16, 19, 20, 24, 25, 26, 30, 31, 32, 35, 36, 40, 41, 42, 46, 47 and 48 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

13. The prior art made record of and not relied upon is considered pertinent to applicant's disclosure:

a. Clarke et al. US Patent 3,988,679 discloses a wideband receiving system including multi-channel filter for eliminating narrowband interference.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 703-305-8326. The examiner can normally be reached on Monday – Friday, 8-5.

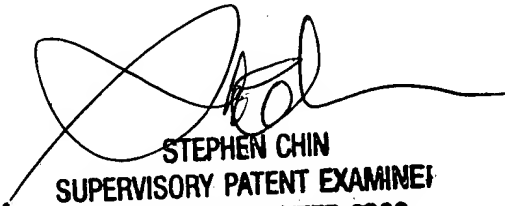
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Cicely Ware

cqw
June 23, 2004



STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800